



ASSOCIATION CONNECTING  
ELECTRONICS INDUSTRIES®

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May 21, 2002

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Ms. Ingrid Rosencrantz  
Office of Solid Waste (5304W)  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, D.C. 20460

**RE: EPA's Intent to Remove Regulatory Barriers to the Recycling of Metal Containing Electroplating Sludge as Discussed in the EPA Final Rule, "Response to Court Order Vacating Regulatory Provisions," 67 FR 11251, March 13, 2002**

Immediate  
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Circuit Center Inc.  
Dayton, OH

Dear Ms. Rosencrantz:

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Michael Hill  
Dynamic Details, Inc.  
Sterling, VA

IPC Government Relations  
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Fern Abrams  
Director, Environmental Policy

John Kania  
Director, Government Relations

IPC – The Association Connecting Electronics Industries would like to thank the U.S. Environmental Protection Agency (EPA) for the opportunity to submit these comments regarding the agency's intention to remove regulatory barriers in order to encourage recycling of metal finishing sludges, as discussed in EPA's Final Rule, "Response to Court Order Vacating Regulatory Provisions," 67 FR 11251 on March 13, 2002. Our members are extremely interested in economically sound measures that will reduce the environmental impact of printed circuit board manufacturing, and we commend the EPA for taking this forward reaching step.

IPC represents over 2,500 member companies involved in the manufacture, assembly and use of printed circuit boards and printed circuit assemblies. Printed circuit boards and printed circuit assemblies are used in a variety of electronic devices including computers, cell phones, pacemakers, and sophisticated missile defense systems. The industry is vital to the U.S. economy, employing more than 400,000 people in every U.S. state and

territory, and exceeding \$44 billion in sales. Although IPC members include electronic giants, such as Intel, Hewlett Packard, and IBM, the vast majority of IPC members meet the Small Business Administration's definition of "small business."

While discussion in the Federal Register specifically references the metal finishing industry, these sludges are also generated through the treatment of wastewater produced during the production of printed circuit boards. Under the Resource Conservation and Recovery Act (RCRA), these metal precipitate sludges are considered an F006 listed hazardous waste when a manufacturing facility ships them off-site for metals recovery. This hazardous waste designation only serves to discourage reuse, recycling and reclamation by greatly increasing the cost of recycling these valuable materials. This results in a large quantity of valuable metal bearing sludges being disposed of in hazardous waste landfills rather than being recycled. The *1998 Metal Finishing Common Sense Initiative F006 Benchmarking Study* found that landfilling was the dominant choice for final disposal of F006.

Printed circuit boards manufacturers are concerned about the environment and the communities in which their employees work and live. Many companies choose, despite economic disincentives, to recycle electroplating waste sludge. However, many of the smaller companies landfill electroplating waste sludge because it is not possible to spend the extra money required for metals recovery and reclamation.

Wastewater treatment sludges from electroplating operations, predominantly from the metal finishing and printed circuit boards industries, represent one of the largest sources in the United States of untapped metal-bearing secondary material amenable to metals recovery. Many of these sludges have potential economic value as a raw material to copper recovery facilities because of their high metals concentration. For instance, raw copper ore normally contains less than 1% copper, where copper precipitate sludges from the printed circuit board industry average 10% to 15% copper.

A number of regulatory and economic factors have resulted in relatively low recovery rates for metal bearing sludges when compared to the over 80% recovery rate for other metal-bearing wastes such as spent lead-acid batteries. Reducing the regulatory barriers would encourage more facilities to reclaim F006, reducing landfill volumes and decreasing the environmental impact of metals mining.

In addition, the limited number of facilities in the United States that can accept electroplating waste sludge for recovery or reclamation further impedes the recycling of the full F006 waste stream. Many potential facilities that could recycle electroplating wastewater sludge through metals recovery have been driven away from recycling by regulatory requirements that result in higher operating costs for facilities that accept F006.

Reclamation of F006 materials by smelters does not handicap their ability to comply with environmental regulations. Recovery and reclamation facilities still must be required to handle materials in a way that is protective of the environment regardless of the RCRA status of printed circuit board electroplating sludge being recycled. With or without a hazardous waste designation, the handling of the sludge will be subject to a full spectrum of OSHA and EPA standards that protect worker health and safety and the environment.

Allowing wastewater treatment sludge from the electroplating process to undergo metal recovery at facilities, which are not regulated as hazardous waste treatment facilities, would substantially lower the cost of recovery by increasing the number, type, and geographical distribution of metals recovery facilities to which electroplating wastewater sludge may be sent. By increasing the number of facilities that can perform metal recovery, capacity for metals recovery would increase with a resultant decrease in disposal charges levied upon printed circuit board facilities.

As a result of the designation of metal bearing electroplating sludge as a RCRA hazardous waste, many potential recyclers in the United States have instead chosen to

work with less regulatory burdened raw ore. As a result, many of the printed circuit board facilities that recycle their scrap or waste products are forced by capacity and economic issues to ship their waste out of the United States for recycling, while environmentally destructive mining operations continue in the United States. Extraction and beneficiation of copper ore can have disastrous environmental impacts including acid mine drainage, erosion and sedimentation, chemical releases, fugitive dust emissions, smelter emissions, habitat modification, direct wildlife mortality, surface and groundwater impacts, disturbance of archaeological sites, and subsidence and decreased aesthetic appeal.

The original listing for F006 was made in 1980. The listing determination was based on the fact that wastewater treatment sludges from electroplating operations was known to contain a variety of metals, namely chromium, cadmium, nickel and complex cyanides. Under the Land Disposal Restrictions of 1986, additional treatment was required to immobilize metal constituents prior to landfilling. Because landfilling and associated treatment are generally less expensive than metals recovery, much F006 is landfilled.

Many of the original conditions upon which this listing was based no longer exist in the industry. For example, although chromic-sulfuric acid etchant was widely used in the printed circuit board industry in the mid-1970s, its use waned in the late 1970s and early 80s. It now has been completely replaced with non-chrome etchants such as ammonia-based etchants. The use of cyanide plating in the industry has also been sharply reduced. It is no longer accurate to say that all F006 waste contains hazardous levels of cyanide, cadmium, and chromium.

Testing conducted to date in two EPA projects - Hadco Corporation's Project XL Initiative and the Metal Finishing Common Sense Initiative F006 Benchmarking Study - have demonstrated that the key factors that originally triggered the sludges listing are no longer applicable for the majority of wastewater treatment sludges from printed circuit board facilities.

Ms. Ingrid Rosencrantz  
May 21, 2002  
Page 5

In conclusion, IPC supports the EPA's intentions to improve the RCRA program by reducing the regulatory barriers to recycling. In particular, regulatory flexibility for electroplating wastewater treatment sludge would increase the quantity of metal precipitates that are recycled through metals reclamation, thus conserving valuable metal resources and better protecting the nation's environment. IPC looks forward to working with EPA to implement our mutual goals of better environmental regulations. If you have any questions or would be interested in learning more about the printed circuit board industry, please contact me at (202) 962-0460.

Sincerely,



Fern Abrams  
Directory of Environmental Policy